

Proposed
State of California
Air Resources Board

Advanced Clean Fleets

Resolution 23-13

April 27, 2023

Agenda Item No.: 23-4-2

Whereas, sections 39600 and 39601 of the Health and Safety Code authorize the California Air Resources Board (CARB or Board) to adopt standards, rules, and regulations, and to do such acts as may be necessary for the proper execution of the powers and duties granted to and imposed upon the Board by law;

Emissions From Motor Vehicles Threaten Public Health and Welfare

Whereas, section 39500 of the Health and Safety Code states that it is the intent of the Legislature that CARB is responsible for controlling emissions from motor vehicles, and for coordinating, encouraging, and reviewing efforts of all levels of government as they affect air quality;

Whereas, sections 43013, 43018, 43100, 43101, 43102, and 43104 of the Health and Safety Code authorize the Board to adopt emission standards, in-use performance standards, and test procedures to control air pollution caused by motor vehicles and motor vehicle engines;

Whereas, section 43013(h) of the Health and Safety Code states that it is the intent of the Legislature that the Board act as expeditiously as feasible to reduce oxides of nitrogen (NO_x) emissions from diesel vehicles and other categories of vehicular and mobile sources which significantly contribute to air pollution problems;

Whereas, section 43018(a) of the Health and Safety Code directs the Board to achieve the maximum degree of emissions reductions possible from vehicular and other mobile sources in order to accomplish the attainment of State standards at the earliest practicable date;

Whereas, section 43018(c) of the Health and Safety Code provides that in carrying out section 43018, the Board shall adopt standards and regulations that will result in the most cost-effective combination of control measures on all classes of motor vehicles and motor vehicle fuel, including, but not limited to, reductions in motor vehicle exhaust and evaporative emissions, and reductions in in-use vehicular emissions through durability;

Whereas, section 39602.5 of the Health and Safety Code directs the Board to adopt rules and regulations pursuant to the authority of Health and Safety Code section 43013 that, in conjunction with other measures, will achieve federal ambient air quality standards by applicable attainment dates;

Whereas, in section 39650 of the Health and Safety Code, the Legislature finds and declares that it is the public policy of the State that emissions of toxic air contaminants should be controlled to levels which prevent harm to the public health;

Whereas, Health and Safety Code sections 39658, 39659, and 39666 authorize the Board to establish airborne toxic control measures for substances identified as toxic air contaminants in accordance with specified criteria;

Whereas, on August 27, 1998, the Board identified particulate matter (PM) from diesel-fueled engines as a toxic air contaminant pursuant to article 3 (commencing with section 39660), division 26, part 2, chapter 3.5 of the Health and Safety Code;

Whereas, in identifying diesel PM as a toxic air contaminant, the Board determined that there is not sufficient scientific evidence to support identification of a threshold level for diesel PM below which no significant adverse health effects are anticipated; this is codified in title 17, California Code of Regulations (CCR), section 93000;

Whereas, section 39667 of the Health and Safety Code authorizes the Board to adopt emissions standards for new motor vehicles to achieve the "maximum possible reduction in public exposure to toxic air contaminants," and states that regulations applicable to new motor vehicles "shall be based upon the most advanced technology feasible for the model year";

Whereas, mobile sources in California and the fossil fuels that power them are the largest contributors to emissions of criteria pollutants, including fine PM (PM_{2.5}), toxic diesel PM, precursors of ground-level ozone (NO_x and hydrocarbons), and emissions of greenhouse gas (GHG), accounting for about 80 percent of ozone precursor emissions and approximately 50 percent of statewide GHG emissions, when accounting for transportation fuel production and delivery;

Whereas, the Legislature has enacted the California Global Warming Solutions Act of 2006 (Assembly Bill (AB) 32),¹ which declares that global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California, and requires a comprehensive multi-year program to reduce California's GHGs emissions to 1990 levels by 2020, and to maintain the emission levels and continue reductions thereafter;

Whereas, in enacting AB 32, the Legislature additionally found that the potential adverse impacts of global warming include "the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems.";

Whereas, Health and Safety Code section 38505 defines "greenhouse gas" or "greenhouse gases" for purposes of Division 25.5 of the Health and Safety Code as including all of the following gases: carbon dioxide (CO₂), methane (CH₄), nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and nitrogen trifluoride;

¹ Health & Saf. Code § 38500, et seq. (Núñez, ch. 488, Stats. of 2006).

Whereas, section 38580 of the Health and Safety Code designates CARB as the agency charged with monitoring compliance and enforcing any regulation adopted by the Board pursuant to Division 25.5 of the Health and Safety Code;

Whereas, in March 2012, Executive Order B-16-2012, was issued to direct California agencies to establish benchmarks for key milestones to help support and facilitate the zero-emission vehicle (ZEV) market in California. One of those key milestones includes deploying over 1.5 million ZEVs on California roads by 2025. The Executive Order also established a 2050 GHG emission reduction target for the transportation sector of 80 percent lower than 1990 GHG levels;

Whereas, in 2016, Senate Bill (SB) 32² was signed into law, which requires CARB to ensure that California's GHG emissions are reduced to at least 40 percent below the 1990 GHG level by 2030;

Whereas, in January 2018, Executive Order B-48-18, was issued to build upon past efforts to boost ZEVs by ordering State entities to "work with the private sector and all appropriate levels of government to put at least 5 million ZEVs on California roads by 2030," and to "spur the construction and installation of 200 hydrogen fueling stations and 250,000 ZEV chargers, including 10,000 direct current fast chargers, by 2025";

Whereas, in August 2018, the Governor sent a letter to CARB, directing it to pursue conversion of public and non-public fleets to ZEVs in categories including large employers, delivery vehicles, and transportation service fleets;

Whereas, in September 2019, Executive Order N-19-19, was issued to require every aspect of State government to redouble efforts to reduce GHG emissions and to mitigate the impacts of climate change while building a sustainable and inclusive economy. The Executive Order specifically directs CARB to propose new strategies to increase demand in the primary and secondary markets for ZEVs, and to consider strengthening existing regulations or adopting new regulations to achieve necessary GHG reductions in the transportation sector;

Whereas, in September 2020, Executive Order N-79-20, was issued to establish a goal that, in pertinent part, 100 percent of medium- and heavy-duty vehicles in the state be zero-emission (ZE) by 2045 for all operations where feasible, and that 100 percent of drayage trucks to be ZE by 2035. The Executive Order further directs CARB to develop and propose "medium- and heavy-duty vehicle regulations requiring "increasing volumes of new ZE trucks and buses sold and operated in the state towards the target of 100 percent of the fleet transitioning to ZEVs by 2045 everywhere feasible and for all drayage trucks to be ZE by 2035";

Whereas, the legislature passed the California Climate Crisis Act (AB 1279)³, which, would declare the policy of the state both to achieve net zero greenhouse gas emissions as soon as possible, but no later than 2045, and achieve and maintain net negative greenhouse gas emissions thereafter, and to ensure that by 2045, statewide anthropogenic greenhouse gas emissions are reduced to at least 85% below the 1990 levels. The bill requires the state board

² Health & Saf. Code § 38566 (Pavley, ch. 249, Stats. of 2016).

³ Health & Saf. Code § 38562.2 (Muratsuchi, ch. 337, Stats. of 2022).

to work with relevant state agencies to ensure that updates to the scoping plan identify and recommend measures to achieve these policy goals;

Whereas, Health and Safety Code section 38510 designates CARB as the State agency charged with monitoring and regulating sources of GHG emissions that cause global warming in order to reduce such emissions;

Whereas, Health and Safety Code section 38560 directs the Board to adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective GHG emission reductions from sources or categories of sources;

Whereas, Health and Safety Code section 38566 directs the Board to ensure that in adopting rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emissions reductions authorized by Division 25.5 of the Health and Safety Code, that statewide GHG emissions are reduced to at least 40 percent below the statewide GHG emissions limit no later than December 31, 2030;

Whereas, California suffers a wider range of the effects of climate change and to a greater degree than other states in the nation, including extreme and prolonged drought, dwindling supplies of fresh water from loss of snowpack, more extensive and severe wildfires, and rising storm surges and sea levels;⁴

Whereas, the increase in the size and severity of California wildfires is directly responsible for thousands of tons of the criteria air pollutants designated under the federal Clean Air Act⁵ of PM, NOx, and volatile organic compounds released into our atmosphere, which extend well beyond our borders;

Whereas, as the U.S. Environmental Protection Agency (U.S. EPA) has recognized, the effects of climate change and rising temperatures from GHG emissions make it more difficult to reduce ozone air pollution that threatens public health;⁶

Additional Measures are Needed to Protect the Public Health and Welfare

Whereas, CARB and California have greatly improved air quality in the state over the past half century. Smog alerts, which peaked at one almost every other day during the 1960s, have been eliminated. During this time, the state has grown its economy while becoming a world leader in environmental policies and clean technologies;

Whereas, despite California's progress in reducing air pollution, more than half (28 million out of nearly 39 million) of all Californians live in urban and rural downwind areas that exceed federal National Ambient Air Quality Standards (NAAQS) for ozone and PM2.5;

⁴ See, e.g., discussion of evidence in 78 Fed. Reg. 2,112, 2,129 (Jan. 9, 2013); State of California Governor's Office of Planning and Research, California Energy Commission, California Natural Resources Agency, *California's Fourth Climate Change Assessment Statewide Summary Report*. (Report #: SUM-CCCA4-2018-013, August 27, 2018), available at: https://www.energy.ca.gov/sites/default/files/2019-11/Statewide_Reports-SUM-CCCA4-2018-013_Statewide_Summary_Report_ADA.pdf

⁵ 42 U.S.C. § 7401, et seq.

⁶ See 74 Fed. Reg. 32,744, 32,763 (July 8, 2009).

Whereas, the South Coast and the San Joaquin Valley Air Basins experience some of the nation's highest PM levels and, together with the Coachella Valley⁷, are the only three areas in the nation with an "extreme" classification for non-attainment with the federal 70 parts per billion (ppb) 8-hour ozone standard;

Whereas, six other areas in California are designated as serious or severe nonattainment with the federal 70 ppb 8-hour ozone standard;

Whereas, on January 27, 2023, U.S. EPA proposed to revise the annual PM_{2.5} NAAQS from its current level of 12 µg/m³ to within the range of 9 to 10 µg/m³;⁸

Whereas, once the revised annual PM_{2.5} NAAQS is finalized, more regions across the State will be designated nonattainment and this will necessitate even more reductions to support attainment;

Whereas, climate change is also contributing to an escalation of serious problems in California along with worsening air quality challenges, including raging wildfires, coastal erosion, extreme weather, disruption of water supply, threats to agriculture, spread of insect-borne diseases, and continuing health threats from air pollution;

Whereas, despite the significant public health improvements produced by CARB's air quality programs, California's disadvantaged communities (DAC), low-income communities, and communities of color continue to experience disproportionate impacts from air pollutants and GHGs, among other inequities that increase residents' health vulnerabilities;

Whereas, medium- and heavy-duty vehicles contribute a quarter of the transportation sector's GHG emissions and a third of the transportation sector's NO_x emissions, which constitutes a disproportionately high share of NO_x emissions, considering such vehicles represent only about 1.8 million trucks among the 30 million registered vehicles in the state;

Whereas, diesel-fueled medium- and heavy-duty vehicles often operate in clusters centered around distribution warehouses, railyards, and ports which further exacerbates the poor air quality in California's DACs;

Whereas, mobile sources emit a complex mixture of air pollutants, including diesel PM, volatile organic compounds, and NO_x, which can lead to the formation of ozone and the secondary formation of PM;

Whereas, diesel PM is a toxic air contaminant composed of over 40 known cancer-causing substances and PM;

Whereas, diesel PM is composed primarily of PM_{2.5}. Due to its small size, inhaled PM_{2.5} can reach the lower respiratory tract and potentially pass into the bloodstream to affect other organs;

⁷ Extreme classification for the Coachella Valley pending U.S. EPA approval.

⁸ U.S. EPA. *Reconsideration of the National Ambient Air Quality Standards for Particulate Matter*, Federal Register Notice 88 FR 5558 updated January 27, 2023. (web link: <https://www.govinfo.gov/content/pkg/FR-2023-01-27/pdf/2023-00269.pdf>, last accessed March 2023).

Whereas, diesel PM can substantially increase the risk of developing cancer and other health problems such as increased respiratory illnesses, risk of heart disease, and premature death;

Whereas, NO_x emissions can undergo chemical reactions in the atmosphere leading to the formation of PM_{2.5} and ozone, which have harmful effects on the respiratory system;

Whereas, NO_x includes nitrogen dioxide, a potent lung irritant when inhaled, which can aggravate lung diseases such as asthma;

Whereas, because NO_x is a precursor to both ozone and to secondary PM_{2.5} formation, reductions in NO_x emissions will also provide benefits for meeting the PM_{2.5} standards;

Whereas, ozone is causally linked to adverse respiratory effects including irritation and damage to lung tissue;

Whereas, nineteen areas in California are designated non-attainment with the 70 ppb ozone NAAQS. Controlling ozone precursor emissions, in particular NO_x, is key to attaining the federal ozone NAAQS;

Whereas, for most areas in California to attain the 70 ppb ozone standard, any and all potential reductions must be pursued, and the proposed Advanced Clean Fleets (ACF) regulation is one of four on-road vehicle measures referenced in the 2022 State Strategy for the State Implementation Plan (SIP) to support attainment of the 70 ppb ozone standard statewide;⁹

Whereas, transportation sources also emit GHG pollutants and short-lived climate pollutants (SLCPs) such as black carbon (BC);

Whereas, BC, or soot, is a component of diesel PM;

Whereas, BC is classified as a SLCP, a category of pollutant that also includes methane and hydrofluorocarbons;

Whereas, SLCPs are powerful climate forcers that can have an immediate and significant impact on climate change, compared to longer lived GHGs such as CO₂;

Less Emitting Combustion and Beyond

Whereas, the proposed ACF regulation would be the next step in CARB's comprehensive strategy to maximize emissions reductions;

Whereas, CARB has recently adopted the Heavy-Duty Omnibus (HD Omnibus) and Heavy-Duty Inspection and Maintenance regulations, which will maximize emissions reductions from conventional new and in-use medium- and heavy-duty vehicles, and CARB's Low Carbon Fuel Standard (LCFS) program strives to achieve the maximum feasible reduction in the carbon intensity of California's transportation fuels. However, more reductions are needed to achieve federal NAAQS and California's goals, and California must move beyond combustion-based strategies and get to ZE solutions;

⁹ California Air Resources Board, [2022 State Strategy for the State Implementation Plan](https://ww2.arb.ca.gov/sites/default/files/2022-08/2022_State_SIP_Strategy.pdf), 2022 (web link: https://ww2.arb.ca.gov/sites/default/files/2022-08/2022_State_SIP_Strategy.pdf, last accessed August 2022).

Whereas, the U.S. EPA's Federal Clean Truck Program (CTP) became effective March 27, 2023 and applies to 2027 model year or newer class 4 and heavier federally-certified heavy-duty vehicles and engines. The CTP sets new, more stringent emissions standards that cover a wider range of operating conditions and require these more stringent emissions standards to be met for longer periods of time.¹⁰ Vehicles certified to these standards will be significantly cleaner than current engines, but will emit more pollution than engines certified to California's HD Omnibus Regulation;

Whereas, the recently adopted HD Omnibus regulation will ensure that compressed natural gas (CNG), and diesel-fueled medium- and heavy-duty engines will meet the cleanest possible emissions standards and other durability improvements throughout their useful lives resulting in the two fuel types being indistinguishable in terms of emissions reductions starting in 2024;

Whereas, engines certified to the preexisting "optional low NOx" standards in the California Code of Regulations, title 13 § 1956.8(a)(2)(A)¹¹ are not cleaner than engines that will need to be certified under HD Omnibus regulation starting in 2024, as evidenced by studies indicating that engines certified to preexisting optional low NOx standards emit levels of NOx emissions that are 3.5 times higher, in-use, than the standards such engines were certified to.¹² In contrast HD Omnibus engines are anticipated to emit levels of NOx in-use that are at the most 1.5 to 2 times the certification standard, because the HD Omnibus regulation also requires engine manufacturers to demonstrate compliance over substantially longer periods, and to improved test methods than those applicable to engines certified to the preexisting optional low NOx engines. Real-world operational characteristics, such as idle time and duty cycles, as well as deteriorating emission control systems because of natural degradation or mal-maintenance as vehicles age and accumulate mileage can lead to real-world internal combustion engine (ICE) vehicle emissions that are often much higher than their certification standard;

Whereas, the number of Class 2b-8 CNG vehicles projected for 2025 is approximately 1 percent of California's statewide heavy-duty vehicles;

¹⁰ U.S. EPA. Control of Air Pollution From New Motor Vehicles: Heavy-Duty Engine and Vehicle Standards. *Federal Register Notice 88 FR 4296* (web link: <https://www.govinfo.gov/content/pkg/FR-2023-01-24/pdf/2022-27957.pdf>)

¹¹ The preexisting "optional low NOx" standards are currently designated as optional standards for 2015 through 2021 model year engines in Cal. Code Regs., title 13 § 1956.8(a)(2)(A).

¹² Leonard et al. January 2023. In-Use Emissions Testing and Activity Profiles for On-Road Heavy-Duty Vehicles: Summary of 200 Heavy-Duty Vehicle Emissions Testing Program from the University of California, Riverside and West Virginia University (web link: <https://www.energy.ca.gov/publications/2023/use-emissions-testing-and-activity-profiles-road-heavy-duty-vehicles-summary-200>, last accessed March 2023).

Whereas, CNG-fueled vehicles operate at a 15 to 20 percent lower fuel economy than their diesel counterparts and after factoring in upstream methane emissions, emit higher levels of GHGs than diesel-fueled trucks;^{13,14}

Whereas, California's organic waste reduction targets were established by Senate Bill (SB) 1383¹⁵ to achieve 75 percent reduction of organic waste into landfills from 2014-levels by 2025;

Whereas, SB 1¹⁶ provides specified commercial vehicles a "useful life" period of between 13 and 18 years before such vehicles can be retired, replaced, retrofitted, or repowered through new or amended regulations. Any actions taken by CARB must be consistent with the requirements of SB 1 to provide a vehicle useful life; and providing any interim regulatory step for combustion technology would trigger a reset of this useful life period, thereby delaying a transition to ZEVs past the target dates;

CARB Planning Documents

Whereas, the proposed ACF regulation would help CARB to achieve the goals set by the 2022 State SIP Strategy, 2021 Mobile Source Strategy, Climate Change Scoping Plan, and 2016 Sustainable Freight Action Plan;

Whereas, the adopted 2022 State SIP Strategy indicates California will fall short of the emissions reductions needed for attainment even with adopting the proposed ACF regulation;

Whereas, CARB's 2016 Sustainable Freight Action Plan identified State agency actions to accelerate use of clean vehicles, equipment, and fuels for freight through targeted introduction of zero and near-ZE technologies;

Whereas, CARB's 2016 Mobile Source Strategy identifies several technology-advancing measures needed to achieve California's air quality and climate goals, including measures to accelerate the deployment of ZEVs in last-mile delivery applications;

Whereas, in March 2017, CARB approved the 2016 State Strategy for the California SIP, which included a commitment to propose a "Last-Mile Delivery" program as a proposed measure to support attainment and maintenance of the NAAQS in California. Staff developed and the Board adopted in June 2020 the Advanced Clean Trucks (ACT) regulation to satisfy this commitment, and the proposed ACF regulation is a complementary measure to further expand the medium- and heavy-duty ZEV market;

Whereas, in October 2021, the Board adopted California's 2021 Mobile Source Strategy which identifies the need to deploy 1.4 million medium- and heavy-duty ZEVs in California by

¹³ CEC Energy Almanac, *Transportation Natural Gas in California*, 2016 (web link: https://ww2.energy.ca.gov/almanac/transportation_data/cng-lng.html, last accessed May 2022).

¹⁴ International Council on Clean Transportation, *A comparison of NOx emissions from heavy-duty diesel, natural gas, and electric vehicles*, 2021 (web link: <https://theicct.org/sites/default/files/publications/low-nox-hdvs-compared-sept21.pdf>, last accessed May 2022).

¹⁵ SB 1383 Lara, Chapter 395, Statutes of 2016.

¹⁶ Health & Saf. Code § 43021 (Beall, ch. 5, Stats. of 2017).

2045, and identifies manufacturing and in-use requirements as necessary to accelerate the penetration of ZE technology;

Whereas, the 2022 State SIP Strategy identifies the emission reductions and measures needed beyond the 2016 State SIP Strategy to meet the 70 ppb 8-hour ozone NAAQS across the State, and includes a commitment to pursue the proposed ACF measure;

Whereas, the adopted 2022 State Strategy for the SIP includes measures to require the use of ZE technologies for trucks to achieve established near and long-term air quality and climate mitigation targets;

Whereas, in December 2017, the Board adopted California's 2017 Climate Change Scoping Plan, which recommends a transition to ZEVs in the transportation sector as a measure to meet the State's GHG emissions and air quality goals and enable long-term de-carbonization of the transportation sector;

Whereas, California's 2022 Climate Change Scoping Plan recommends a scenario to achieve the SB 32 GHG reduction target by 2030 and AB 1279 carbon neutrality goal by 2045 or earlier, and identifies economy-wide decarbonization needs including a rapid movement to ZE transportation by 2040;

Whereas, the Legislature enacted AB 617¹⁷, which highlights the need for further emission reductions in communities with high exposure burdens, such as those located near facilities where trucks operate;

Whereas, pursuant to AB 617, multiple community emissions reduction programs adopted by air districts and approved by the Board for high-emissions exposure-burdened communities include specific measures to reduce emissions and exposures resulting from truck operations;

Whereas, CARB's statewide strategy, known as the Community Air Protection Program Blueprint, helps to reduce exposure to criteria pollution and toxic air contaminants in emissions-burdened communities;

All Californians Deserve Equitable Access to Clean Air and the Benefits of ZE Technology

Whereas, CARB recognizes it is imperative to meaningfully integrate equity and environmental justice considerations into programs and policies in partnership with affected communities. The proposed ACF regulation would ensure accelerated benefits in DACs in a number of ways. Drayage trucks that operate at ports and intermodal rail yards would transition to ZE by 2035. Most last-mile delivery and light-duty package delivery vehicles transition to ZE by 2035, improving emissions in all neighborhoods impacted by increasing delivery traffic. Other warehouse freight operations would be transitioned to ZE by 2039, with some of the largest concentrations of warehouse truck activity occurring around DACs. All State and local government vehicle purchases would be ZE by 2027, ensuring government leads the way which benefits all communities throughout the state. Finally, the proposed rule

¹⁷ (Garcia, Stats. 2017 Ch. 136). Health and Safety Code Sections new sections 39607.1, 40920.6, 40920.8, 42411, 42705.5, 44391.2, amendments to sections 42400, 42402.

establishes the end of new medium- and heavy-duty combustion sales such that all new trucks sold in California would need to be ZE by 2036, ensuring all communities benefit from reduced transportation pollution;

Whereas, California seaports have recognized the need to establish and implement ZE vehicle and equipment policies to mitigate the negative public health impacts that seaport activities burden nearby communities with. These policies have been described in documents such as the Port of San Diego Maritime Clean Air Strategy, San Pedro Bay Ports 2017 Clean Air Action Plan, and Port of Oakland Seaport Air Quality 2020 and Beyond Plan;

ZEV Benefits and Market Advancement

Whereas, ZEV technologies eliminate all tailpipe emissions of both criteria pollutants and GHGs when vehicles operate under all operating conditions, which positively affects California's air quality and climate challenges;

Whereas, medium- and heavy-duty battery-electric vehicles (BEVs) are four to five times as efficient as comparable internal combustion powered vehicles;

Whereas, ZEVs have two fundamentally superior technical features as compared to conventional vehicles, greater flexibility in the source of upstream energy, and higher vehicle efficiency. ZEVs can convert over 77 percent of the electrical energy from the grid to power at the wheels, whereas conventional gasoline vehicles only convert about 12 to 30 percent of the energy stored in gasoline to power at the wheels. Hydrogen fuel cell vehicles have 2 to 3 times the efficiency of conventional vehicles because of the electric motor's efficient conversion of energy;

Whereas, due to ZEVs' higher efficiencies and lower energy consumption, ZEVs reduce dependence on petroleum and reduce total emissions substantially, compared to conventional vehicles. The superior fuel efficiency and greater upstream energy source flexibility of ZEVs will help pave the way to a low carbon future for California's transportation sector;

Whereas, manufacturers continue to invest heavily in ZE technology in response to California's ZEV incentives, regulations, and international regulations and incentives, leading to technology improvements that have resulted in lower cost ZEV componentry. This has enabled nearly every manufacturer to accelerate plans to bring to market more ZEVs in more market segments;

Whereas, international efforts to adopt medium- and heavy-duty ZEVs will also benefit California. For example, it is estimated that there will be more than 800 ZE truck and bus models available internationally by the end of 2022, which indicates the ZEV market is expanding rapidly internationally, and these same drivetrains or configurations could be brought to California and United States markets;

Whereas, multinational original equipment manufacturers (OEMs) and specialty upfitters are demonstrating and offering ZE and plug-in hybrid trucks across many specialized configurations beyond simple box and flatbed applications, including armored cash-in-transit, autocarriers, arborist and utility bucket trucks, frame mounted cranes, custom chassis truck cranes, front, side, rear and roll-off type refuse, sewer maintenance, vehicle recovery and

towing, construction vocational dump and readi-mix concrete, heavy haul logging and mining transport, snow removal and sanding, and near-zero-emissions vehicle (NZEV)¹⁸ emergency municipal fire and airport crash response, ZE ambulance as well as smaller ZE public safety vehicles;

Whereas, ZE Class 8 tractors and straight trucks are being deployed into bulk applications including milk and related products, transportation fuel, and tarmac-delivered aviation gasoline and jet fuel;

Whereas, ZE and NZEV vehicles have demonstrated the ability to reliably operate at high altitudes and cold climates in diverse applications including grocery delivery, dedicated line haul, bulk mail transport, logging, mining transfer, refuse, terminal tractors, school buses and emergency fire response;

Whereas, dozens of truck and bus manufacturers exclusively sell ZE trucks and buses, and nearly all of the established medium- and heavy-duty vehicle manufacturers have announced plans to sell a wide range of ZE vans, trucks, and buses in the United States;

Whereas, the population of light-duty package-delivery vehicles are expected to grow rapidly with expanding e-commerce deliveries, and accordingly, regulating such vehicles in the high priority and federal fleets requirements is necessary to ensure emissions reductions in last-mile delivery operations;

Whereas, package and mail delivery fleets are well-suited for electrification because they primarily return to base daily, operate on fixed or predictable routes in cities and neighborhoods, and have frequent stops. Several major delivery companies have begun the process of incorporating ZE light-duty package delivery vehicles into their fleets with 100,000 ordered by Amazon; 10,000 ordered by UPS; 4,500 ordered by Walmart; 500 ordered by FedEx; and over 66,000 announced by the U.S Postal Service for placement throughout the United States;

Whereas, the majority of trucks operating in California travel less than 100 miles per day, except for semi-trucks where most average less than 200 miles per day;

Whereas, ZEV weight is only expected to be an issue for high-mileage or high-usage applications, and according to a recent study, weight may only be an issue for about 10 percent of the largest trucks on the road and may only affect about 2 percent of the most common dry van tractor trailer combination at maximum weight;¹⁹

Whereas, medium- and heavy-duty ZEVs that are capable of meeting the typical needs of local and regional trucking operations and vocational uses are commercially available today;

Whereas, improvements in battery density over time have increased the range and payload and have reduced weight impacts of ZE technology, and such trends are expected to continue;

¹⁸ As defined in title 13, as defined in title 13, CCR section 1963(c)(16) is a vehicle capable of operating like a ZEV using electricity stored on-board the vehicle for a minimum number of miles.

¹⁹ North American Council for Freight Efficiency, *Lightweighting*, 2021 (Web link: <https://nacfe.org/technology/lightweighting-2/>, last accessed August 2022).

Whereas, Vehicle Code section 35551(f) allows ZEVs and NZEVs to exceed California's maximum vehicle weight limits by 2,000 pounds;

Whereas, hydrogen has relatively high energy density and is suited for longer range applications. Hydrogen's greater energy density allows fuel-cell electric vehicles (FCEVs) to have lower vehicle weights when compared to BEVs with substantially more than 150-mile range;²⁰

Whereas, manufacturers are investing in FCEV technology and have a number of medium- and heavy-duty FCEVs being demonstrated in the Class 6 and 8 weight classes;

Whereas, although medium- and heavy-duty ZEVs currently have higher upfront capital costs than conventional vehicles, they have lower fuel and maintenance costs that are expected to result in a positive total cost of ownership (TCO) in most applications where they are suitable. Medium- and heavy-duty ZEVs result in a lower TCO when compared to purchasing new gasoline or diesel counterparts in some applications today, and in nearly all applications by 2030;

Whereas, after accounting for all costs borne by affected fleets operating in California, the proposed ACF regulation is estimated to result in a net savings of over \$48 billion between 2020 and 2050. This amount does not include the indirect health cost savings projected for the regulation;

Whereas, fleets that carefully estimate their electricity demands and vehicle charging strategies may be able to benefit from electricity price rate structures to minimize their electricity costs;

Whereas, the recently passed Inflation Reduction Act of 2022 (IRA),²¹ provides credits, rebates and loans that reduce the statewide cost of medium- and heavy-duty ZEVs by \$2.3 billion since there are no restrictions on using these credits to meet regulatory requirements;

Whereas, the ZEV requirements for light-duty package vehicles subject to the proposed high-priority and federal fleets requirements are not projected to have direct costs on the State nor new benefits because those costs are already accounted for in the Advanced Clean Car 2 regulations;

Whereas, ZEVs provide advantages over conventional vehicles, including quiet vehicle operation that improves safety on work sites, and enables later work shifts during times with less traffic and more efficient delivery schedules, and less time spent on scheduled maintenance or out-of-service time due to the mechanical simplicity of ZEV systems;

Infrastructure and Grid Readiness

Whereas, California's existing electrical grid and approved investments occurring now will allow the state to handle millions of electric vehicles in the near-term, and projections show

²⁰ US Department of Energy, *Fuel Cell and Battery Electric Vehicles Compared*, 2014 (web link: https://www.energy.gov/sites/default/files/2014/03/f9/thomas_fcev_vs_battery_evs.pdf, last accessed August 2022).

²¹ Inflation Reduction Act of 2022, Pub. L. 117-169, 136 Stat. 1818, 2090 (2022).

the broader western grid can handle up to 24 million light-duty, 200,000 medium-duty, and 150,000 heavy-duty ZEVs without requiring any additional power plants;²²

Whereas, the proposed regulation will increase the number of medium- and heavy-duty trucks on the road in 2035, the California Energy Commission (CEC) forecast using CARB ACF numbers expects their annual charging needs to represent about 3.1 percent of the system's annual load. Further, CEC staff models hourly impacts. While medium- and heavy-duty trucks will need 3.0 percent of the State's electricity demand in 2035 on average over the year, they will only contribute about 1.4 percent to peak hour demand of 5:00 PM to 8:00 PM;²³

Whereas, the California Public Utilities Commission (CPUC) has been robustly assessing the future electricity needs of the state, and has approved utility investments for upgrading the electric grid along with electricity rate changes to fund those investments,²⁴ and has opened a new proceeding to modernize and prepare the grid in anticipation of multiple distributed energy sources;²⁵

Whereas, the electrification of California's entire transportation sector, combined with increased electrification of the state's building stock, will require further investments in transmission and local distribution systems and coordinated grid planning efforts;

Whereas, although an increase in electricity demand is anticipated with the widespread adoption of electric vehicles, electric vehicles can aid in managing grid resources and can improve resilience of the grid;

Whereas, vehicle-to-grid services including bi-directional charging and one-directional passive load shifting create opportunities to reduce system costs and facilitate renewable energy integration;

Whereas, state agencies in California and other stakeholders are working to update the State's roadmap to integrate electric vehicle charging needs with the needs of the electrical

²² PNNL 2020. Kintner-Meyer, Michael, et al, *Electric Vehicles at Scale – Phase I Analysis: High EV Adoption Impacts on the Western U.S. Power Grid*. Pacific Northwest National Laboratory, 2020 (web link: https://www.pnnl.gov/sites/default/files/media/file/EV-AT-SCALE_1_IMPACTS_final.pdf, last accessed August 2022).

²³ California Energy Commission. *2022 IEPR California Energy Demand Forecast "Planning Scenario" 8760 Hourly Files: CED 2022 Hourly Forecast - CAISO - Planning Scenario*, (web link: <https://www.energy.ca.gov/data-reports/reports/integrated-energy-policy-report/2022-integrated-energy-policy-report-update-2>)

²⁴ CPUC, *California Public Utilities Commission. Proposed Decision: Order Instituting Rulemaking to Modernize the Electric Grid for a High Distributed Energy Resources Future*, 2022 (web link: <https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/infrastructure/transportation-electrification/electricity-rates-and-cost-of-fueling>, last accessed August 2022).

²⁵ CPUC, Version 2.0 of its Distributed Energy Resources (DER) Action Plan. (web link: <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M467/K470/467470758.PDF> , last accessed March 2022).

grid. The update will reflect advancements in vehicle-to-grid technology and include actions the State can take to advance California's transportation electrification goals;²⁶

Whereas, a Statement of Intent outlines the significant coordination occurring between California's agencies to ensure the demand for charging stations and hydrogen fueling will be met, has been signed by CARB, CEC, CPUC, California State Transportation Agency, California Transportation Commission, Caltrans, the Governor's Office of Business and Economic Development and the Department of General Service. The principles of cooperation contained in the Statement of Intent include: ensuring equity in infrastructure development and deployment, data sharing between agencies, regular and meaningful communication between agencies, joint grant solicitations where feasible and robust engagement with fleets and other stakeholders;

Whereas, CARB recognizes the unique challenges presented by cross-border trucking and will work with international and local governments as well as our state agency partners to assist establishing ZEV fueling infrastructure at the border;

Whereas, AB 2127²⁷ requires the CEC to biennially assess the electric vehicle charging infrastructure needed to meet the state's goals ZEV adoption targets, and SB 643²⁸ requires the CEC to prepare in consultation with CARB, the CPUC, and other specified state agencies, a statewide assessment of FCEV infrastructure, fuel production, and distribution needed to meet California's ZE truck, bus, and off-road vehicle goals as set in Executive Order N-79-20, as well as any CARB regulation that requires or allows ZE heavy-duty and off-road vehicles;

Whereas, CARB closely collaborates with the CEC so the CEC can project demand for heavy-duty charging infrastructure and to ensure CEC and utilities are better equipped to assess grid impacts and infrastructure needs at the regional and local levels;

Whereas, CEC is developing the Electric Vehicle Supply and Equipment Deployment and Grid Evaluation tool that will not only help stakeholders identify suitable locations for charger deployments, but also act as an early warning system for utilities and grid planners to identify locations where grid upgrades may be required to support high charging demand;

Whereas, CPUC has directed the major investor-owned utilities (IOUs) to establish policies to minimize the impacts of Public Safety Power Shutoff events on the electrical grid;

Whereas, those IOUs have adopted stringent short-term reliability standards to help monitor local unscheduled power outages, such as outages resulting from a storm, car-pole accident, or equipment failure, that allow for an acceptable outage risk of typically one to two hours per year;

Whereas, ZEVs offer tremendous potential to support the resiliency of the electrical grid through smart charging and vehicle-to-grid (or load) applications, while microgrid technology can ensure that ZEVs stay fueled during power disruptions;

²⁶ CEC. 2021. *Electric Vehicle Charging Infrastructure Assessment - AB 2127* (web link: <https://efiling.energy.ca.gov/getdocument.aspx?tn=238853>)

²⁷ Public Resource Code § 25229 (Ting, Chapter 365, Statutes of 2018)

²⁸ Health & Saf. Code § 43871 (Archuleta, Chapter 646, Statutes of 2021)

Whereas, insulating ZEV fleets from Public Safety Power Shutoff events can be accomplished with robust energy storage systems both within the utility distribution systems and at fleet sites, such as designing charging infrastructure to include energy storage and clean back-up power generation;

Whereas, CPUC with CEC's support, is leading on-going efforts to develop standards, protocols, guidelines, methods, rates, and tariffs that serve to support and reduce barriers to microgrid deployment;

Whereas, the CPUC established a 125-day timeline that utilities must meet, on average, to connect customers with electric vehicle (EV) infrastructure to the grid, referred to as energizing new EV electric load. The timeline includes 25 days that EV charging typically needs to obtain local permits. The decision also outlines steps the utilities must take to make the energization process more understandable and transparent for customers. The CPUC requires utilities to gather data necessary for regulators and the public to better understand any bottlenecks or parts of the process that are slowing down energization;²⁹

Whereas, CEC has estimated that 157,000 high powered chargers will be needed by 2030 to support 181,000 medium- and heavy-duty vehicles;³⁰

Whereas, depot or home-base refueling is ideal for fleets, such as postal delivery operations, last mile and regional delivery operations, bus operations, and governmental organizations, that utilize a hub and spoke operation where vehicles return to a home base at the end of the shift. Such fleets are well-suited for initial electrification because the infrastructure for overnight charging operations can be centralized and managed. Such fleets may also augment daily operations with an opportunity charge at a public or private charger during the day;

Whereas, fleets operating longer distances and those without access to home base charging will benefit from high-speed public charging infrastructure;

Whereas, California is taking several actions to ensure reliable and affordable infrastructure will be available in rural areas of the state. For instance, the CEC is continuing to study the availability of public chargers across California and examine the location and distance vehicle owners would need to travel to publicly charge. This ongoing work overlaps with both the light-duty and heavy-duty focus and serves as a foundation to inform rural investment needs;

Whereas, pursuant to Senate Bill (SB) 350,³¹ the California Public Utility Commission unanimously approved three large-scale medium- and heavy-duty transportation

²⁹ California Public Utilities Commission, *CPUC Takes Action To Support Transportation Electrification*, 2022 (web link: <https://www.cpuc.ca.gov/news-and-updates/all-news/cpuc-takes-action-to-support-transportation-electrification#:~:text=Governor%20Gavin%20Newsom%20has%20advanced,%241.8%20billion%20on%20EV%20charging>, last accessed February 2022).

³⁰ California Energy Commission, *Assembly Bill 2127 Electric Vehicle Charging Infrastructure Assessment*, 2021 (web link: <https://efiling.energy.ca.gov/getdocument.aspx?tn=238853>, last accessed August 2022).

³¹ (De León, Stats. 2015, ch. 547). Health and Safety Code new section 44258.5. Labor Code new sections 25302.2 and 25327. Public Utilities Code section new sections 237.5, 400, 454.51, 454.52, 454.55, 454.56, 9621, and 9622. Amendments to Labor Code sections 1720, 25310, and 25943; amendments to Public Utilities Code

electrification programs to install infrastructure needed to support medium- and heavy-duty electric vehicles operated by fleets. Pacific Gas and Electric, Southern California Edison, and San Diego Gas and Electric have been authorized to spend \$236 million, \$343 million, and \$107 million, respectively over a 5-year period to invest in infrastructure upgrade projects;

Whereas, the CEC approved an unprecedented \$2.9 billion investment plan that accelerates California's 2025 EV charging and hydrogen refueling goals. The funds will support the deployment of thousands of ZE trucks, school buses and transit buses to deliver clean air benefits to communities hit hardest by the impacts of pollution from medium- and heavy-duty vehicles. The plan approved includes: \$1.7 billion for medium- and heavy-duty ZEV infrastructure, \$118 million for ZEV manufacturing, \$90 million for hydrogen refueling infrastructure, \$97 million for emerging opportunities such as aviation, locomotive, marine vessels and vehicle-grid integration, \$15 million zero- and near-zero-carbon fuel production and supply, \$10 million for workforce development;³²

Whereas, the Energy Infrastructure Incentives for ZE Commercial Vehicles or EnergIIZE Commercial Vehicles Project is funded by the CEC and implemented by CALSTART and partner Tetra Tech. EnergIIZE, with a total authorized allocation of \$276 million through 2026, provides incentives to purchase infrastructure equipment for medium- and heavy-duty ZEVs operated and domiciled in California. Through these incentives, EnergIIZE will help to achieve the target set in Governor Newsom's Executive Order N-79-20 for medium- and heavy-duty fleets statewide to transition to ZEVs by as early as 2035;

Whereas, there are now 56 hydrogen retail stations open to the public in California today, and the State of California is working to build 200 hydrogen refueling stations in the next 5 years, 13 of these new stations will also offer fueling for commercial vehicles;

Whereas, private industry, including truck manufacturers, are investing in public medium- and heavy-duty ZEV fueling infrastructure networks in the United States and in California to support retail fueling and interstate operations;

Whereas, the majority of the major truck OEMs and infrastructure providers are participating in a task force to create a common solution for high-power charging of fully commercial heavy-duty EVs, and is working out the requirements for connectors, electric vehicle supply equipment, communications, safety, and related hardware;

Whereas, commercial high-powered public charging is available today, but is still developing and will eventually play a role in enabling longer-range battery-electric trucks (e.g., sleeper cabs);

337, 352, 359, 359.5, 365.2, 366.3, 399.4, 399.11, 399.12, 399.13, 399.15, 399.16, 399.18, 399.21, 399.30, 701.1, 740.8, 740.12, 9505, and 9620.

³² California Energy Commission, *2022–2023 Investment Plan Update for the Clean Transportation Program*, 2022 (web link: <https://www.energy.ca.gov/publications/2022/2022-2023-investment-plan-update-clean-transportation-program>, last accessed February 2023)

Whereas, conventional fuel suppliers are working with industry to develop fast charging solutions at or near truck stops, and hydrogen station developers are currently adding hydrogen fueling to several retail heavy-duty diesel stations;³³

Whereas, hydrogen station developers including Chevron and Iwatani, who have been building hydrogen stations for light-duty vehicles with CEC funding assistance, are also committing to build stations without government funding;³⁴

Whereas, truck manufacturers have backed up their ZEV production targets with private investment in rolling out infrastructure necessary for the success of these vehicles including the Daimler led team's \$650 million on the West Coast, Southeast Coast and Texas, Volvo's teaming with their dealerships to create a California charging corridor and with Pilot/Flying-J to electrify truck stops nationally, Hyundai's partnerships to install hydrogen fueling from the San Pedro ports into Texas, and Nikola's initial Southern California hydrogen fueling stations and hydrogen supply agreements as a step toward their a national network. GM has partnered with Pilot/Flying-J to roll out 2,000 cobranded public fast charging points. In Europe Daimler, Traton and Volvo have launched the €500 million euros, Milence, a joint venture to field 1,700 public heavy-duty charging points;

Whereas, private investment is creating ZEV infrastructure in California and beyond including public charging, electrified truck stops and depots and all-inclusive "vehicle-as-a-service" packages including examples from Electrify America, Enride, Highland Electric, Prologis, TerraWatt's multistate I-10 electrification, Thompson Truck Centers, Volvo/Mack, WattEV, ZEEM, and others. And there are similar efforts in Europe where examples include a project by Total/Air Liquide partnership developing a major hydrogen corridor from Benelux port facilities through France and Germany and another project by BP Pulse creating a Rhine-Alpine charging corridor through Germany;

California Is Not Alone

Whereas, as more jurisdictions adopt California's ZEV regulations and supporting policies, the ZE supply chains will grow, prices will continue to drop (benefitting consumers and fleets), new economic opportunities for electric vehicle supply equipment providers will continue to expand, and growing numbers of communities will benefit from the resulting air quality improvements;

Whereas, through section 177 of the federal Clean Air Act, six other states have already completed adoption of the ACT regulation (Massachusetts, New Jersey, New York, Oregon, Vermont, and Washington) and two more states (Colorado and North Carolina) are currently in the public process considering adopting the ACT regulation;

³³ California Air Resources Board, *2021 Annual Evaluation of Fuel Cell Electric Vehicle Deployment and Hydrogen Fuel Station Network Development*, 2021 (web link: https://ww2.arb.ca.gov/sites/default/files/2021-09/2021_AB-8_FINAL.pdf, last accessed August 2022).

³⁴ Chevron, *Iwatani Agreement 30 Hydrogen Stations in CA — Chevron.com*, 2022 (web link: <https://www.chevron.com/newsroom/2022/q1/chevron-iwatani-announce-agreement-to-build-30-hydrogen-fueling-stations-in-california>, last accessed August 2022).

Whereas, New York has signed legislation to incorporate the same ZEVs deadlines shared with Governor Newsom's Executive Order N-79-20 for heavy-duty, light-duty, and off-road vehicles;

Whereas, five other states (Illinois, Indiana, Michigan, Minnesota, and Wisconsin) have created a Regional Electric Vehicle Midwest Coalition Memorandum of Understanding to accelerate medium- and heavy-duty ZE technology deployment via collaboration on infrastructure, manufacturing, and equity actions;³⁵

Whereas, a Memorandum of Cooperation signed in June 2022 lays the foundation for potential collaboration on medium- and heavy-duty ZE policy and regulation between California and Canada.³⁶ This builds on Canada's commitment to decarbonize the transportation sector that has already seen actions including the path to 100 percent sales of light duty trucks by 2035 and over a half a billion dollars in medium- and heavy-duty ZEV incentive funding;^{37,38}

Whereas, seventeen states, one Canadian province and the District of Columbia have signed on to the multi-state Medium- and Heavy-Duty ZEV Memorandum of Understanding;³⁹

Whereas, California is also collaborating with the 16 countries and numerous regional, city and private entities of the Global Commercial Vehicle Drive To Zero program in support of the 100 percent ZE new truck and bus sales in 2040 goals, and is currently chairing the Transportation Decarbonization Alliance of countries, regions, cities and companies, and promoting the goals of the ZE Vehicle Transition Council with membership spanning from Mexico to Canada and Europe to Asia;^{40,41,42}

³⁵ Regional Electric Vehicle Midwest Coalition, *Memorandum of Understanding Between Illinois, Indiana, Michigan, Minnesota, and Wisconsin*. (web link: [https://www.michigan.gov/-/media/Project/Websites/leo/REV_Midwest_MOU_master.pdf?rev=6dd781b5a4eb4551b3b3a5b875d67fb9#:~:text=THIS%20MEMORANDUM%20OF%20UNDERSTANDING%20\(%E2%80%9CMOU,the%20%E2%80%9CParticipating%20States%E2%80%9D](https://www.michigan.gov/-/media/Project/Websites/leo/REV_Midwest_MOU_master.pdf?rev=6dd781b5a4eb4551b3b3a5b875d67fb9#:~:text=THIS%20MEMORANDUM%20OF%20UNDERSTANDING%20(%E2%80%9CMOU,the%20%E2%80%9CParticipating%20States%E2%80%9D), last accessed August 2022).

³⁶ Government of Canada, *Memorandum of Cooperation between the Government of Canada and the Government of the State of California of the United States of America concerning Climate Action and Nature Protection*. (web link: <https://www.canada.ca/en/services/environment/weather/climatechange/climate-plan/reduce-emissions/memorandum-cooperation-canada-california-climate-action-nature-protection.html>, last accessed August 2022).

³⁷ Energy.gov, *Regional Clean Hydrogen Hubs Notifications*, 2022 (web link: <https://www.energy.gov/oced/regional-clean-hydrogen-hubs-notifications>, last accessed February 2023).

³⁸ Transport Canada, *ZE vehicles*, 2022, (web link: <https://tc.canada.ca/en/road-transportation/innovative-technologies/ZE-vehicles>, last accessed August 2022).

³⁹ *Multi-State Medium- and Heavy-Duty Zero Emission Vehicle Memorandum of Understanding*. 2020 (web link: https://www.energy.ca.gov/sites/default/files/2020-08/Multistate-Truck-ZEV-Governors-MOU-20200714_ADA.pdf, last accessed August 2022).

⁴⁰ Drive to Zero, *Pledge Partners*, 2022, (web link: <https://globaldrivetozero.org/about/pledge-partners/>, last accessed August 2022).

⁴¹ Transportation Decarbonisation Alliance, *TDA Members*, 2022 (web link: <https://tda-mobility.org/tda-members/>, last accessed August 2022).

⁴² ZEV Transition Council, 2022 (web link: <https://zevtc.org/the-council/members/>, last accessed August 2022).

Whereas, the U.S. federal administration at COP27 signed a Memorandum of Understanding to advance ZE Medium- and Heavy-Duty Vehicles committing to work toward 30 percent by 2030 and 100 percent by 2040;⁴³

Whereas, California is one of the stakeholders the U.S. federal administration signed memorandum of understanding (MOU) among the Department of Energy, Department of Transportation, the Environmental Protection Agency, and the Department of Housing and Urban Development resolves to “work closely with” to fully decarbonize transportation by 2050;⁴⁴

Whereas, the European Union’s (EU) recent proposal will strengthen fleet-wide average CO₂ emissions performance standards for new medium- and heavy-duty vehicles above 5 tonnes or heavier, to 45 percent by 2030, 65 percent by 2035, and 90 percent by 2040 lower than 2019-levels, with expected implementation starting in 2024. This is one regulatory proposal considered in a larger framework referred to as the “Fit for 55” package which also includes drafts of other EU climate and energy legislation that underpin their political pledge to cut GHG emissions by at least 55 percent in 2030 compared to 1990-levels. As part of this package, renewable energy targets will also be strengthened along with vehicle CO₂ emissions standards;

Whereas, the Infrastructure Investment and Jobs Act , also known as the “Bipartisan Infrastructure Law” (BIL) provides approximately \$350 billion for Federal highway programs over a five-year period (fiscal years 2022 through 2026), invests \$7.5 billion to build out the first-ever national network of EV chargers in the United States, and roughly \$65 billion investment to upgrade our power infrastructure, creates a new Grid Deployment Authority, invests in research and development for advanced transmission and electricity distribution technologies, and promotes smart grid technologies that deliver flexibility and resilience. It also invests in demonstration projects and research hubs for next generation technologies like advanced nuclear, carbon capture, and clean hydrogen. As one of these two new programs, the National Electric Vehicle Infrastructure Formula Program provides \$5 billion as the first major Federal funding program that focuses on a nationwide development of EV charging infrastructure;⁴⁵

Whereas, the IRA comes at a critical time, helping reduce the 23 percent of total U.S. GHG emission from on-road transportation. The IRA clean transportation provisions will speed up progress towards the Biden administration’s ZEV and climate goals. The IRA is expected to accelerate electrification so that by 2030, between 39–48 percent of new class 4–8 vehicle

⁴³ CalStart, [COP27](https://globaldrivetozero.org/2022/11/16/cop27-usa-growing-number-nations-sign-global-mou/), November 17, 2022 (web link: <https://globaldrivetozero.org/2022/11/16/cop27-usa-growing-number-nations-sign-global-mou/>, last accessed February 2023).

⁴⁴ U.S. Department of Energy. [Memorandum of Understanding Between the The U.S. Department Of Energy, The U.S. Department Of Transportation, The U.S. Environmental Protection Agency, And The U.S. Department Of Housing And Urban Development](https://www.energy.gov/sites/default/files/2022-09/mou-doe-dot-epa-hud-final_09-15-2022.pdf), 2022 (web link: https://www.energy.gov/sites/default/files/2022-09/mou-doe-dot-epa-hud-final_09-15-2022.pdf, last accessed February 2023)

⁴⁵ Federal Highway Administration, U.S. Department of Transportation. Federal Register Notice 87 FR 37262 updated June 22, 2022. [National Electric Vehicle Infrastructure Formula Program](https://www.govinfo.gov/content/pkg/FR-2022-06-22/pdf/2022-12704.pdf) (web link: <https://www.govinfo.gov/content/pkg/FR-2022-06-22/pdf/2022-12704.pdf>, last accessed February 2023)

sales are ZEV and by 2032, between 44–52 percent of new vehicle sales are ZEVs. Class 3 and lighter vehicles show similar increases;⁴⁶

Whereas, the Biden-Harris Administration, through the U.S. Department of Energy (DOE), announced funding to accelerate the creation of ZEV corridors that expand the nation's ZEV charging infrastructure. DOE has awarded \$7.4 million to seven projects to develop medium- and heavy-duty electric vehicle ZEV charging and hydrogen corridor infrastructure plans that will benefit millions of drivers across 23 states;⁴⁷

Whereas, the Federal Government, including the U.S. Postal Service, will use its scale and procurement power to achieve: 100 percent carbon pollution-free electricity on a net annual basis by 2030, including 50 percent 24/7 carbon pollution-free electricity, and 100 percent ZEV acquisitions by 2035;

Whereas, the U.S. Postal Service, as the nation's largest civilian public fleet and with significant footprint in California has already committed to the purchase of 66,000 ZEVs by 2028, to purchase exclusively ZEVs from 2026 forward and to install the necessary infrastructure for operating them. The U.S. Postal Service is both establishing new ZEV production capacity as well as seeking a mix of commercial off-the-shelf ZEVs, thus supporting the further development of a variety of ZEV supply chains;

Whereas, the major multinational truck manufacturers acknowledged in 2020 the science-based need to decarbonize their products fully by 2040 and have individually asserted substantial midterm targets in 2030 to reach their 2040 target. For example, Volvo Trucks has stated it is committed to produce 50 percent of its trucks as ZEVs in 2030 globally, Daimler has committed to produce 60 percent of its trucks as ZEVs by 2030 and 100 percent by 2039, and Navistar committed to produce 50 percent of its trucks as ZEVs by 2030 and 100 percent by 2040. GM and Stellantis have each announced or released electric pickups and vans. Furthermore, Ford has announced their entire commercial vehicle lineup in Europe will be ZE capable – all-electric or plug-in hybrid – by 2024, and entirely battery-electric by 2030;

California's Incentive Programs and other Support

Whereas, incentives play a critical role in supporting the State's climate change, air quality, ZE deployment, and petroleum reduction goals. Incentives accelerate the transition of fleets to ZE as well as support equitable, community-driven clean transportation and multi-sector approaches. CARB's incentive programs support the early commercialization and market development prior to regulatory requirements by reducing incremental costs and supporting vehicle cost reductions over time, and have generally accelerated early markets for advanced technologies, including ZEVs;

⁴⁶ International Council on Clean Transportation. *White Paper: Analyzing the Impact of the Inflation Reduction Act on Electric Vehicle Uptake in the United States*, 2023 (web link: <https://theicct.org/publication/ira-impact-evs-us-jan23/>, last accessed February 2023)

⁴⁷ United States Department of Energy, *Biden-Harris Administration Announces Funding for ZE Medium- and Heavy-Duty Vehicle Corridors, Expansion of EV Charging in Underserved Communities*, 2023. (web link: <https://content.govdelivery.com/accounts/USEERE/bulletins/348f531>, last accessed February 2023)

Whereas, the State Legislature appropriated \$657 million dollars for medium-duty and heavy-duty trucks in 2021 and \$675 million in 2022, which supported the Hybrid and ZE Truck and Bus Voucher Incentive Program (HVIP) which offers point-of-sale discounts to support the transition of heavy-duty trucks and buses to cleaner technologies, with a focus on the unique needs of small fleets and owner/operators;

Whereas, Innovative Small eFleets is a pilot incentive program within HVIP that provides innovative funding mechanisms geared towards supporting small fleets' transition to ZE trucks;

Whereas, CARB allocated \$90 million from the Volkswagen Environmental Mitigation Trust for the state-wide deployment of ZE Class 8 freight and port drayage trucks;

Whereas, the Board increased the cost effectiveness limits for on-road technologies in the Carl Moyer Memorial Air Quality Standards Attainment Program (Moyer) and the Voucher Incentive Program in November 2021 to ensure small fleets, small businesses, and communities with priority populations will successfully transition to and benefit from zero-emission heavy-duty vehicles on a statewide basis. Those programs provide the opportunity to improve access and increase program engagement in environmental justice communities, increase outreach and educational tools for communities and small fleets to learn about zero-emission technologies, provide greater support and access for small fleets and small businesses statewide and accelerate zero-emission truck funding while also better partnering with other infrastructure incentive opportunities;

Whereas, the Truck Loan Assistance Program helps small business truck owners that fall below conventional lending criteria and are unable to qualify for traditional financing for cleaner trucks including ZE options. The Truck Loan Assistance Program can be 'stacked' with a number of other incremental ZE cost offsetting incentives;

Whereas, the new initiative called "R2: Refuse Reimagined" will double the number of ZE refuse trucks in California in 2023;

Whereas, CARB's Project 800 initiative supported the purchase and accelerated deployment of ZE trucks at California ports;

Whereas, the LCFS regulation works to reduce the overall carbon intensity of fuels used in California. It provides an opportunity for commercial fleets to generate credits for dispensing electricity or hydrogen, with a low-carbon intensity, into ZEVs. The credit value can offset some or all of the fuel cost and improves the total cost of ownership for ZEVs while stimulating the low carbon fuel market;

Whereas, Governor Newsom's Office of Business and Economic development helped create the Alliance for Clean Renewable Hydrogen Energy Systems, a not-for-profit LLC public-private partnership, to compete for DOE hydrogen hubs funding;⁴⁸ and

⁴⁸ California Governor's Office of Business and Economic Development, *California Launches Statewide Alliance to Establish Federally Co-Funded Hydrogen Hub*, 2022. (web link: <https://mailchi.mp/gobiz/california-formally-announces-intention-to-create-a-renewable-hydrogen-hub-8132768?e=1cc54c34ef>, last accessed February 2023)

Whereas, CARB will provide continued outreach to all fleets with a focus on small fleets and those in DACs.

Advanced Clean Fleets Regulation

Whereas, the proposed ACF regulation is part of CARB's portfolio of regulatory strategies to decarbonize the transportation sector in the medium- and heavy-duty vehicle sector, which includes the Innovative Clean Transit regulation, which will transition the State's transit fleet to ZE by about 2040,⁴⁹ the ZE Airport Shuttle Bus regulation, which requires 100 percent of regulated airport shuttle fleets to be ZEVs by Dec. 31, 2035, and the ZE Powertrain Certification regulation, that establishes certification requirements for zero-electric powertrains in 2021 and newer medium- and heavy-duty ZEVs;^{50,51}

Whereas, the proposed ACF regulation would regulate an additional 40,000 light-duty vehicles, but would not increase the number of light-duty ZEVs deployed in California, as the required ZEV purchases by light-duty delivery fleets does not exceed the number of ZEVs light-duty manufacturers are required to sell into California due to the Advanced Clean Car regulation or the Advanced Clean Car II regulation;⁵²

Whereas, Public Resources Code (PRC) section 25722.11 requires state agencies to purchase minimum numbers of new heavy-duty ZEVs beginning in 2025. Consequently, state agencies subject to the proposed governmental fleet requirements will be able to utilize new heavy-duty ZEVs purchased to comply with the proposed ACF regulation to also comply with the requirements of PRC section 25722.11;

Whereas, CARB adopted the ACT regulation on June 2020, and that regulation became effective under state law on March 15, 2021. The ACT regulation requires manufacturers that certify Class 2b–8 chassis or complete vehicles with combustion engines to sell medium- and heavy-duty ZEVs as an increasing percentage of their annual California sales from 2024 to 2035. By 2035, ZEV sales need to be 55 percent of Class 2b–3 truck sales, 75 percent of Class 4–8 straight truck sales, and 40 percent of truck tractor sales;

Whereas, more work is needed to achieve the significant reductions of criteria pollutants and GHGs in order to attain federal and state ambient air quality standards, to address harms resulting from climate change, and to meet California's goals to decarbonize the transportation sector. The proposed ACF regulation would therefore build upon and expand the ACT regulation to attain further emissions reductions from the transportation sector and

⁴⁹ The ICT regulation is comprised of Cal. Code Regs., tit. 13, sections 2023 to 2023.11.

⁵⁰ The ASB regulation is comprised of Cal. Code Regs., tit. 17, sections 95690.1 to 95690.8.

⁵¹ The ZE Powertrain regulation is comprised of Cal. Code Regs., tit. 13, section 1956.8. and tit. 17 section 95663.

⁵² The Advanced Clean Car regulation is comprised of Cal. Code Regs. tit. 13, sections 1900, 1956.8, 1960.1, 1961, 1961.4, 1962.1 through 1962.8, 1965, 1968.2, 1968.5, 1969, 1976, 1978, 2037, 2038, 2062, 2112, 2139, 2140, 2145, 2147, 2235, and 2317. The ACC II regulation is comprised of Cal. Code Regs., tit. 13, sections 1900, 1961.2 through 1961.8, 1962.2, 1962.3, 1962.4 through 1962.8, 1965, 1968.2, 1969, 1976, 1978, 2037, 2038, 2112, 2139, 2140, 2147, 2317, and 2903.

would continue CARB's efforts to decarbonize the transportation sector by requiring State and local government fleets, drayage trucks, high priority fleets, and federal fleets to phase in medium- and heavy-duty ZEVs and ZEV light-duty package delivery vehicles over time;

Whereas, the proposed ACF regulation would increase the expected number of medium- and heavy-duty ZEVs above those already required by existing regulations by about 190,000 ZEVs by 2035, by about 570,000 ZEVs by 2045, and by about 740,000 ZEVs by 2050;

Whereas, there are no comparable federal requirements for fleets to purchase or use ZE technologies for vehicles greater than 8,500 lbs. gross vehicle weight rating (GVWR), and there are also no federal requirements for 100 percent sales of ZE technologies for Class 2b-8 vehicles beginning in 2036 or later;

Whereas, staff has proposed the ACF regulation as set forth in Appendix A to the Initial Statement of Reasons, which was released to the public on August 31, 2022, for a 45-day comment period;

Whereas, CARB's regulatory program that involves the adoption, approval, amendment, or repeal of standards, rules, regulations, or plans has been certified by the Secretary for Natural Resources under Public Resources Code section 21080.5 of the California Environmental Quality Act (CEQA; California Code of Regulations, title 14, section 15251(d)), and CARB conducts its CEQA review according to this certified program (California Code of Regulations, title 17, sections 60000-60007);

Whereas, CARB prepared a draft environmental analysis under its certified regulatory program for the proposed regulation entitled *Draft Environmental Analysis Prepared for Advanced Clean Fleets (Draft EA)*, and circulated it as Appendix D to the Staff Report for 45 days from September 2 through October 17, 2022;

Whereas, the Draft EA concluded that implementation of the proposed regulation has the potential to result in: beneficial impacts to long-term operation-related air quality, long-term operation-related energy demand, and long-term operation-related GHG emissions and climate change; less than significant impacts, or no impacts, to short-term construction-related energy demand, short-term construction-related GHG emissions and climate change, short-term construction-related and long-term operation-related land use and planning, mineral resources, population and housing, public services, recreation, and wildfire; and potentially significant adverse impacts to short-term construction-related and long-term operation related aesthetics, agricultural and forest resources, air quality (due to short-term, construction-related emissions), biological resources, cultural resources, geology, seismicity, and soils, hazards and hazardous materials, hydrology and water quality, noise and vibration, transportation and traffic, tribal cultural resources, and utilities and service systems;

Whereas, on October 27, 2022, the Board conducted a public hearing on the proposed ACF regulation and the Draft EA prepared for the proposal;

Whereas, following the public hearing, the Board directed the Executive Officer to evaluate providing more time for infrastructure development and for trucks using renewable fuels in response to CalRecycle's Organic Waste Landfill Diversion Regulation, continue working with transit fleets and utilities to ensure they can do their important work, streamline criteria for other flexibilities, and assess moving up the end date for sales of new combustion trucks,

conduct additional stakeholder outreach, and make any additional appropriate conforming modifications, available for public comment, with any additional supporting documents and information, for a period of at least 15 days;

Whereas, staff updated the original proposal in response to the Board direction and stakeholder concerns and made this available to the public through a series of two focused workgroups and one broader workshop. Waste and Wastewater provisions were discussed at the December 12, 2022 workshop which was attended by 253 remote and more than 23 in-person participants; Infrastructure Construction Delays and ZEV Purchase Exemption was discussed at the January 13, 2023 workgroup which was attended by 717 remote and 49 in-person participants; and a final February 13, 2023 workgroup on the draft 15-day revisions to the original proposal was attended by 77 in-person and 1,015 remote participants;

Whereas, the proposed ACF regulation is projected to reduce statewide emissions by 29.3 tons per day of NO_x and 1.80 tons per day of PM_{2.5}, which are estimated to lead to 2,526 fewer cardiopulmonary deaths; 401 fewer hospital admissions for cardiovascular illness; 478 fewer hospital admissions for respiratory illness; and 1,177 fewer emergency room visits for asthma which will provide significant health benefits for Californians;

Whereas, the total estimated monetized impact associated with the above-mentioned statewide health benefits is \$26.5 billion;

Whereas, the emission reductions from the proposed ACF regulation are critical to achieving carbon neutrality by 2045 by reducing cumulative GHG emissions in California from 2024 to 2050 by 327 million metric tons. These projections do not account for upstream emissions associated with producing and delivering the fuel or energy source to vehicles and accordingly represent a conservative estimate of projected emissions reductions;

Whereas, the estimated benefit of the reduced GHG emissions reductions attributable to the proposed ACF regulation between 2024 and 2050 ranges from \$9.8 billion to \$38.7 billion;

Whereas, the proposed ACF regulation would reduce emissions of BC and therefore reduce emissions of an identified SLCP;

Whereas, SLCPs, including methane, are powerful climate forcers that can have an immediate and significant impact on climate change, compared to longer lived GHGs such as CO₂;

Whereas, the proposed ACF regulation would provide public or private waste and wastewater fleets involved in municipal diversion of organic waste an additional three years before they must transition their CNG trucks powered by bio-methane to ZEV. This extension will give more time for markets capitalizing on bio-methane captured from organic waste diversion facilities to develop;

Whereas, a majority of drayage hubs served by drayage trucks are located in or within less than one mile of a community classified as disadvantaged by CalEPA;

Whereas, the proposed ACF regulation would require all drayage trucks to be ZE by 2035, which would greatly benefit air quality in neighborhoods surrounding these locations;

Whereas, the proposed ACF regulation would also require fleets operating near distribution centers, warehouses, and major roadways, that are commonly located around more densely populated urban areas, including in low-income and DACs, to acquire ZEVs beginning 2024, which will reduce emissions of criteria pollutants and GHGs that benefit all communities, including low-income and DACs;

Whereas, the proposed ACF regulation builds on the ACT regulation by establishing additional demand for ZE medium- and heavy-duty trucks, and will spur further build-out of zero-electric charging and hydrogen fueling infrastructure;

Whereas, fleets operating longer distances and those without access to home base charging will benefit from high-speed public charging infrastructure;

Whereas, the proposed ACF regulation provides flexibility for fleets to initially target the infrastructure that is best suited for their purposes;

Whereas, an expansion of the medium- and heavy-duty ZEV market will lead to a robust secondary used ZEV market to help transition other fleets not included in the proposed regulation;

Whereas, the proposed ACF regulation targets fleets best suited for electrification while allowing flexibility over a longer time horizon for other fleets to transition to ZEVs;

Whereas, the proposed ACF regulation would primarily require that 50 percent of new vehicle additions to state and local government fleets to be ZEVs starting January 1, 2024, increasing to 100 percent of new vehicle additions, starting January 1, 2027. Municipalities primarily in designated low-population counties or those that operate ten or fewer vehicles would be excluded until 2027;

Whereas, the proposed ACF regulation would primarily allow existing drayage trucks with ICEs to operate for a minimum time period, would require all new trucks placed in drayage service after 2024 to be ZEVs, and would require all trucks conducting drayage operations to be ZEVs by 2035. Drayage trucks are on-road, heavy-duty trucks that transport containerized bulk or break-bulk goods, empty containers, and chassis to and from seaports and intermodal railyards;

Whereas, the proposed ACF regulation would primarily require high-priority fleets and federal fleets to only add new ZEVs to their California fleets beginning 2024, and to remove existing vehicles from their fleets as soon as they reach specified minimum useful lives. High-priority and federal fleets would also be allowed to optionally use specified phased-in compliance schedules that establish increasing ZEV targets set as percentages of the total vehicle fleet. High priority fleets include entities with more than \$50 million in annual revenues, or those fleets that own, operate, or direct at least 50 medium- and heavy-duty trucks and buses under common ownership and control. Affected vehicles under the high-priority and federal fleet requirements include on-road medium- and heavy-duty vehicles, light-duty package delivery vehicles with GVWR equal to or less than 8,500 lbs., and off-road yard tractors that operate in California;

Whereas, the proposed regulation would require every new Class 2b-8 vehicle sold in California to be zero emitting, beginning 2036;

Whereas, the proposed regulation would exclude certain vehicles with two-engines, military tactical vehicles, historical vehicles, heavy cranes, emergency vehicles, dedicated snow removal vehicles, transit buses subject to the Innovative Clean Transit (ICT) regulation, test fleet vehicles, and school buses;

Whereas, the proposed regulation also contains provisions that are designed to accommodate delays or circumstances that prevent fleet owners from complying in good faith with the regulation due to circumstances beyond their control;

Whereas, the proposed regulation allows state and local government fleets and high priority and federal fleet requirements to fulfill their obligations using NZEV technologies, like plug-in hybrid electric vehicles prior to 2035;

Whereas, the proposed regulation schedules are designed to match projected vehicle capabilities and includes provisions to address situations where a ZEV is not available or where a given ZEV cannot meet the fleet owner's duty cycle needs;

Whereas, the "ZEV Milestones Option" provides fleets flexibility to comply by meeting a ZEV percentage of their total fleet by key milestone dates that are phased-in by truck type;

Whereas, the proposed regulation requires fleets to purchase new ICE vehicles certified to California standards. This requirement ensures fleets are purchasing the cleanest engines when granted ZEV purchase exemptions, or when otherwise purchasing ICE vehicles under the ZEV Milestones Option;

Whereas, the proposed regulation allows fleets to keep their vehicles for their full useful life as defined by SB 1, which ensures existing vehicles can be used until the end of their defined useful lives;

Whereas, the ZEV Milestones Option increases flexibility for fleets with a higher turnover rate while continuing to maintain a timeframe that coincides with ZEV deployment and air quality goals, as well as other program objectives;

Whereas, the ZEV Milestones Option supports an increased and more cost-effective ZEV transition for the fleets that elect to use it and would result in more significant air quality and health benefits, and in an earlier timeframe than otherwise would be required;

Whereas, the proposed regulation is not projected to impact the California economy by more than 0.2 percent of the baseline;

Whereas, the Board further directed the Executive Officer to evaluate all comments received during the public comment periods, including comments on the Draft EA, and prepare written responses to EA comments as required by CARB's certified regulations at California Code of Regulations, title 17, sections 60000-60007, and Government Code section 11346.9(a);

Whereas, the Chair directed the Executive Officer to present to the Board, at a subsequently scheduled public hearing, staff's written responses to any comments on the Draft EA, along

with the Final EA, for consideration for approval, and the finalized regulations for consideration for adoption;

Whereas, following the Board hearing, the modified regulatory language and supporting documentation were circulated for 15-day public comment period(s), with the changes to the originally proposed text clearly indicated, according to provisions of California Code of Regulations, title 1, section 44 and Government Code section 11340.85, March 23 to April 7, 2023;

Whereas, staff reviewed written comments received on the Draft EA and prepared written responses to those comments in a document entitled *Response to Comments on the Environmental Analysis Prepared for Advanced Clean Fleets* (Response to EA Comments);

Whereas, on as released to the public on April 17, 2023, staff posted on the rulemaking page the Final EA, which includes minor revisions, and the Response to EA Comments;

Whereas, prior to the duly noticed public hearing held on April 27, 2023, staff presented the Final EA and the Response to EA Comments, on as released to the public on April 17, 2023, to the Board for consideration;

Whereas, a public hearing and other administrative proceedings have been held according to the provisions of Chapter 3.5 (commencing with section 11340), part 1, division 3, title 2 of the Government Code; and

Whereas, in consideration of the Notice of Proposed Rulemaking, the ISOR, 15-Day Notice, the documents and evidence referenced and incorporated in these documents, and written comments and public testimony on the proposed ACF regulation, the Board finds that:

- 1) Despite California's progress in reducing emissions from mobile sources, stationary sources, and area sources, California still has the most severe air pollution problems in the United States.
- 2) To meet federal and state ambient air quality standards, to address the harms resulting from climate change, to meet California's goals to transition the State's medium- and heavy-duty vehicle fleet to 100 percent zero--emissions everywhere feasible, and set an earlier target for drayage trucks to be zero--emissions by 2035, and to decarbonize the transportation sector, CARB must continue to seek reductions from all sources under its authority, including on-road medium- and heavy-duty vehicles and light-duty package delivery vehicles, and off-road yard tractors that operate in California.
- 3) Emissions from mobile sources, including on-road medium- and heavy-duty vehicles, light-duty package delivery vehicles, and off-road yard tractors and the fossil fuels that power them are significant contributors to the emissions of criteria pollutants, including fine PM_{2.5}, toxic diesel PM, precursors of ground-level ozone (NO_x and hydrocarbons), and emissions of GHGs.
- 4) Despite the significant public health improvements produced by CARB's air quality programs, California's DACs, low-income communities, and communities of color continue to experience disproportionate impacts from air pollutants and GHGs that increase their residents' health vulnerabilities.

- 5) Diesel-fueled medium- and heavy-duty vehicles often operate in clusters centered around distribution warehouses, railyards, and ports which further exacerbates the poor air quality and the associated adverse health impacts in California's DACs.
- 6) Additional emission reductions of NO_x and PM_{2.5} are needed from on-road medium- and heavy-duty vehicles, light-duty package delivery vehicles, and off-road yard tractors to support California's statewide and regional attainment of the health-based NAAQS for ozone and PM_{2.5}, and to reduce GHG emissions that contribute to climate change.
- 7) Emissions of diesel PM and the associated localized cancer risk harm communities surrounding seaports, marinas, harbors, and marine terminals.
- 8) Additional reductions of NO_x and PM_{2.5} emissions from on-road medium- and heavy-duty vehicles, light-duty package delivery vehicles, and off-road yard tractors are needed to assist the South Coast and San Joaquin Valley Air Basins in attaining NAAQS.
- 9) Reducing GHG emissions from on-road medium- and heavy-duty vehicles, light-duty package delivery vehicles, and off-road yard tractors will help California to achieve its goals of reducing emissions of both GHGs and SLCPs.
- 10) Anthropogenic climate change is a significant and growing problem that must be addressed to avoid more serious effects in the near future.
- 11) To reduce the mounting impacts of climate change, California must substantially reduce the emissions of GHGs and SLCPs from on-road medium- and heavy-duty vehicles, light-duty package delivery vehicles, and off-road yard tractors.
- 12) California is already experiencing the adverse effects of climate change, which include raging wildfires, coastal erosion, extreme weather, disruption of water supply, threats to agriculture, spread of insect-borne diseases, and continuing health threats from air pollution.
- 13) ZEV technologies eliminate all tailpipe emissions of criteria pollutants and GHGs from vehicles and will consequently achieve the maximum degree of emission reductions possible from vehicular sources.
- 14) ZEV technologies are the most advanced technology feasible for 2024 and subsequent model year vehicles, and will achieve the maximum possible reduction in public exposure to diesel PM.
- 15) ZEV technologies achieve the maximum technologically feasible and cost-effective reductions of GHGs.
- 16) Medium- and heavy-duty ZEVs are commercially available today, and are already capable of meeting the average needs of local and regional trucking operations and a variety of vocational uses.
- 17) The proposed ACF Regulation was developed using the best available information and will achieve technologically feasible and cost-effective criteria pollutant emission reductions from medium- and heavy-duty vehicles.
- 18) It is necessary to accelerate the widespread adoption of ZEVs in the medium- and heavy-duty truck sector and in light-duty package delivery vehicles in certain fleets

that are best suited to incorporate and benefit from such vehicles beginning in 2024, in order to reduce the criteria emissions and GHGs emitted from such vehicles to the greatest extent possible.

- 19) Establishing increasingly aggressive ZEV phase-in requirements provides affected fleets the flexibility to acquire and use ZEVs in the most suitable applications first, while providing flexibility to acquire ZEVs over a longer time compliance period and will help accelerate the development of a heavy-duty public infrastructure network.
- 20) The proposed ACF regulation is needed to increase the number of medium- and heavy-duty ZEVs in California beyond the numbers of such ZEVs anticipated from the ACT regulation; the proposed ACF regulation is projected to increase the number of such ZEVs by 570,000 by 2045 and would, in conjunction with the already adopted ACT regulation, increase the projected numbers of medium- and heavy-duty ZEVs in California to over 1.6 million in 2050.
- 21) Certain entities, specifically entities with lower levels of financial income and entities that own or operate lower numbers of medium- and heavy-duty vehicles are not as well suited as other fleets in acquiring and using ZEVs.
- 22) Requiring state and local government fleets to purchase only ZEVs or NZEVs⁵³ when such fleets acquire new vehicles appropriately accommodates the budget fluctuations and cycles state and local governmental agencies experience.
- 23) Providing state and local government fleets located in designated low population counties additional time to comply with the proposed ACF regulation is warranted because those areas have fewer air quality challenges than other parts of the state, the fleets based in these areas tend to have fewer vehicles, operate in remote areas that are expected to take longer for ZEV infrastructure and support networks to be developed, and tend to have more limited budgets than other state and local government fleets.
- 24) Requiring all new drayage trucks to be ZEVs by 2024, and all existing drayage trucks to be ZEVs by 2035 is necessary and appropriate to achieve the maximum feasible reduction of emissions from drayage trucks given the suitability of drayage truck duty cycles to be met by ZEV technology, and the significant and disproportionate impact of drayage truck emissions on DACs.
- 25) Requiring specified larger fleets and federal fleets to retire conventional ICE vehicles when such vehicles reach the end of their useful lives, and to only purchase ZEVs beginning in 2024 is necessary and appropriate to reduce the criteria emissions and GHGs emitted from such vehicles to the greatest extent possible.
- 26) Providing specified larger fleets, federal fleets, and state and local government fleets the option to alternatively acquire ZEVs on a schedule based on the composition and size of their California fleets is appropriate given that this option (ZEV Milestones Option) provides fleets greater flexibility to add and remove vehicles from their

⁵³ Near-zero Emissions Vehicles are defined as vehicles that are capable of operating like a ZEV using electricity stored on-board the vehicle for a minimum number of miles.

California fleets, while achieving similar reductions of criteria emissions and GHGs as the primary compliance option.

- 27) Requiring larger fleets and federal fleets to include light-duty package delivery vehicles in their California fleets is necessary to ensure the emissions emitted from such vehicles are reduced to the greatest extent possible.
- 28) Requiring 100 percent of new medium- and heavy-duty vehicle sales to be ZEVs by 2036 is necessary and appropriate to ensure that vehicle manufacturers, infrastructure providers, and ZEV components suppliers will commit resources in developing and supporting such ZEVs, ensuring that ZEV technology advancements continue.
- 29) The proposed ACF regulation appropriately contains provisions that establish compliance extensions and exemptions that provide flexibility for fleet operators needed to address ZEV feasibility, or scheduling delays resulting from circumstances beyond their control, which includes delays in obtaining grid power.
- 30) Providing more time to phase in ZEVs for waste and wastewater fleets with CNG trucks who are implementing strategies to capture biomethane is necessary to shift the use of biomethane towards hard-to-decarbonize sectors or as a feedstock for hydrogen.
- 31) Exempting transit agencies until January 1, 2030, will allow them to focus on electrifying their transit buses instead of their maintenance trucks.
- 32) Requiring fleet owners to purchase California-certified engines when purchasing 2024 or newer engines is necessary to ensure the lowest emitting ICE engines are used in California.
- 33) Requiring fleets to report specified information will help CARB ensure that all affected entities comply with the proposed ACF regulation.
- 34) The reporting requirements applicable to manufacturers in the proposed regulations are necessary for the health, safety, and welfare of the people of the state.
- 35) The proposed ACF regulation is projected to reduce statewide emissions by 29.3 tons per day of NOx and 1.8 tons per day of PM2.5, which are estimated to lead to 2,526 fewer cardiopulmonary deaths; 401 fewer hospital admissions for cardiovascular illness; 478 fewer hospital admissions for respiratory illness; and 1,177 fewer emergency room visits for asthma which will provide significant health benefits for Californians.
- 36) The total estimated monetized impact associated with the above-mentioned statewide health benefits is \$26.5 billion.
- 37) The emission reductions from the proposed ACF regulation are critical to achieving carbon neutrality by 2045 by reducing cumulative GHG emissions in California from 2024 to 2050 by 327 million metric tons. These projections do not account for upstream emissions associated with producing and delivering the fuel or energy source to vehicles and accordingly represent a conservative estimate of projected emissions reductions.

- 38) The estimated benefit of the reduced GHG emissions reductions attributable to the proposed ACF regulation between 2024 and 2050 ranges from \$9.8 billion to \$38.7 billion.
- 39) The proposed ACF regulation is necessary, appropriate, technologically feasible, and cost-effective.
- 40) The Proposed Amendments are consistent with CARB's environmental justice goals of reducing exposure to air pollutants and reducing adverse health impacts from toxic air contaminants in all communities, especially those historically overburdened by air pollution sources.
- 41) The Proposed Amendments were developed in an open public process, in consultation with affected parties, through numerous public workshops, individual meetings, and other outreach efforts, and these efforts are expected to continue as the regulation is implemented.
- 42) The significant public health and welfare benefits of the proposed ACF regulation and the time needed by the regulated community to comply provide good cause for it to become effective as expeditiously as possible.
- 43) The proposed ACF regulation is within the scope of CARB's authority and legislative direction to address the serious problem of air pollution in California, and in particular meet CARB's statutory obligations identified in the following sections of the Health and Safety Code as explained below:

Sections 39500, 39600, 39601, and 39602.5, because the proposed ACF regulation is consistent with the Legislature's intent that CARB is assigned the responsibility to control motor vehicle emissions, and is being promulgated under CARB's duty to perform actions needed to properly execute the powers and duties granted to it, including adopting standards, rules and regulations needed to properly execute such powers and duties, including regulations adopted pursuant to section 43013 that are necessary, technologically feasible, and cost effective that will, in conjunction with other measures, help California attain federal ambient air quality standards, respectively;

Sections 38505, 38510, 38560, and 38566, because the proposed ACF regulation is being promulgated under CARB's authority to regulate sources of GHGs, and it achieves the maximum technologically feasible and cost-effective reductions of GHGs needed to ensure California's emissions of GHGs are reduced to at least 40 percent below the State's GHG emissions limit by December 31, 2030;

Sections 39650, 39658, 39659, 39666, and 39667, because the proposed ACF regulation is being promulgated under CARB's authority to establish airborne toxic measures to control diesel PM, an identified toxic air contaminant, and the proposed regulation is based on the most advanced technology feasible for the model year, which will achieve the maximum possible reduction in public exposure to diesel PM;

Sections 43013 and 43018, because CARB has determined that the proposed ACF regulation is necessary, cost effective, and technologically feasible, and the regulation will reduce emissions of NO_x from diesel vehicles and other categories of vehicular and mobile sources that significantly contribute to air pollution, and emissions of other pollutants as expeditiously as feasible;

Sections 43100, 43101, 43102, and 43105, because the ACF regulation adopts emissions standards and associated test procedures for new motor vehicles and new motor vehicle engines and requires that new motor vehicles first sold in California to meet such standards.

- 44) The proposed ACF regulation is consistent with the Legislature's intent under the Administrative Procedure Act to promote performance standards; specifically, the proposed ACF regulation only specifies that fleets must acquire specified ZEV vehicles, defined as vehicles that emit no criteria or GHG emissions in their exhaust emissions, but do not specify or require use of any specified technology to meet those standards;
- 45) To the extent the proposed ACF regulation does specify the sole means of compliance through specific actions, measures, or other quantifiable means, it only applies to specific classes of vehicles and their inherent attributes, which is necessary to accurately confirm compliance with the requirements to ensure that motor vehicle emissions are permanently reduced;
- 46) The proposed ACF regulation does not contain a scientific basis or scientific portion subject to peer review, and thus no peer review as set forth in Health and Safety Code section 57004 needed to be performed;
- 47) The proposed ACF regulation was developed in an open public process, in consultation with affected parties, through numerous public workshops, individual meetings, and other outreach efforts, and these efforts are expected to continue;
- 48) No reasonable alternatives to the proposed ACF regulation considered to date, or that have otherwise been identified and brought to the attention of CARB, would be more effective at carrying out the purpose for which the regulation is proposed or would be as effective and less burdensome to affected entities than the proposed regulation; and
- 49) The proposed ACF regulation is consistent with CARB's environmental justice policies and does not disproportionately impact people of any race, culture, or income.

The Resolutions of the California Air Resources Board

Now, therefore, be it resolved that the Board hereby certifies that the Final EA, including the Response to EA Comments, on as released to the public on April 17, 2023, was completed in compliance with CARB's certified regulatory program to meet the requirements of CEQA, reflects the agency's independent judgment and analysis, and was presented to the Board

whose members reviewed and considered the information therein before taking action to adopt the regulation.

Be it further resolved that in consideration of the Final EA, the Response to EA Comments, and the entirety of the record, the Board adopts the Findings and Statement of Overriding Considerations.

Be it further resolved that the Board hereby adopts sections 2013, 2013.1, 2013.2, 2013.3, 2013.4, 2014, 2014.1, 2014.2, 2014.3, 2015, 2015.1, 2015.2, 2015.3, 2015.4, 2015.5, 2015.6, and 2016 in Title 13 California Code of Regulations, as all as set forth in Appendices A-1 through A-4 to the ISOR and subsequently modified as proposed in Appendices A-1 through A-4 of the 15-Day Notice, and as subsequently modified with nonsubstantial changes that were released to the public on April 17, 2023.

Be it further resolved that the adopted regulatory text may be further revised with non-substantial or grammatical changes, which will be added to the rulemaking record and indicated as such.

Be it further resolved that the Board directs the Executive Officer to determine if additional sufficiently-related modifications to the regulations are appropriate, and that if no additional modifications are appropriate, the Executive Officer shall take CARB's final step for final approval of such amendments through submittal of the Board-approved rulemaking package to the Office of Administrative Law. The Executive Officer may revise the adopted regulations with grammatical and other non-substantial changes, indicate them as such, and add them to the rulemaking record. If the Executive Officer determines that additional sufficiently-related substantial modifications are appropriate, the modified regulatory language shall be made available for public comment, with any additional supporting documents and information, for at least 15 days, and the Executive Officer shall consider written comments submitted during the public review period and make any further modifications that are appropriate available for public comment for at least 15 days. The Board delegates to the Executive Officer the authority to both (1) either approve or disapprove proposed changes in regulatory language under Government Code section 11346.8(c), and (2) conduct any appropriate further environmental review associated with such changes, consistent with the Board's Certified Regulatory Program regulations, at California Code of Regulations, title 17, sections 60000-60008, for those sufficiently-related substantial modifications. Alternatively, rather than taking action on the proposed modifications, the Executive Officer may instead present the modifications, and any appropriate further environmental review associated with the modifications, to the Board for further consideration, if the Executive Officer determines further Board consideration is warranted.

Be it further resolved that the Board directs the Executive Officer to finalize the Final Statement of Reasons, submit the completed rulemaking package to the Office of Administrative Law, and transmit the Notice of Decision to the Secretary of the Natural Resources Agency for posting.

Be it further resolved that the Board hereby determines that the regulations adopted herein will not cause California's motor vehicle or off-road engine emission standards, in the aggregate, to be less protective of public health and welfare than applicable federal standards.

Be it further resolved that the Executive Officer shall, upon adoption, forward the regulations to the Environmental Protection Agency with a request for a waiver or authorization or confirmation that the regulations are within the scope of an existing waiver of federal preemption pursuant to section 209(b) or authorization pursuant to section 209(e)(2)(A) of the Clean Air Act, as appropriate.

Be it further resolved that the Board hereby adopts the regulations as revisions to the California SIP.

Be it further resolved that the Board hereby directs the Executive Officer to submit the regulations, together with the appropriate supporting documentation, to the U.S. EPA for approval as a revision to the California SIP, to be effective, for purposes of federal law, upon approval by U.S. EPA.

Be it further resolved that the Board directs the Executive Officer to work with the U.S. EPA and take appropriate action to resolve any completeness or approvability issues that may arise regarding the SIP submission.

Be it further resolved that the Board authorizes the Executive Officer to include in the SIP submittal any technical corrections, clarifications, or additions that may be necessary to secure U.S. EPA approval.

Be it further resolved that the Board certifies pursuant to 40 C.F.R. section 51.102 that the proposed SIP revision was adopted after notice and public hearing as required by 40 C.F.R. section 51.102.

Be it further resolved, there is still a need to push for more ZEV deployments beyond the proposed ACF regulation in future measures as proposed in the 2022 State SIP Strategy including the ZE Truck Measure that will be heard by the Board in 2028. This measure would seek to accelerate the number of ZEV beyond existing measures by implementing regulatory strategies to achieve the goal of transitioning the remainder of the heavy-duty combustion fleet to ZE. Recognizing the ongoing disproportionate health burdens experienced by communities nearby California seaports and railyards, this measure would include transitioning smaller fleets of dedicated use vehicles (dedicated auto transports, fuel delivery vehicles, and mobile cranes) that fall below the ACF High Priority and Federal Fleets applicability threshold.

Be it further resolved that the Board directs the Executive Officer to evaluate increasing the ACT regulation's requirements to meet or exceed the number of ZEVs deployed consistent with the State Implementation Plan.

Be it further resolved that the Executive Officer shall pursue additional staff resources as necessary to allow for earlier assessment, development, and presentation of manufacturer-based regulatory proposals to achieve additional emission reductions from medium- and heavy-duty vehicles, and pursue additional legislative authorities to use market signal tools such as differentiated registration fees, restrictions and fees for combustion trucks entering low and ZE zones, and/or indirect source rules which would allow for a flexible, smooth, and equitable path to get to 100 percent ZE heavy-duty California fleet which is consistent with the SIP. This assessment would include an update of the feasibility to increase ZEV sales percentage in the ACT requirements consistent with achieving 100 percent ZEV sales in 2036 and will also include an assessment to ramp-up tractor sales requirements starting in

2030. These additional actions should strive to achieve a transition to ZEV by 2045 everywhere feasible, while emphasizing emission reductions within disadvantage communities while protecting drivers and enabling high-road job creation.

Be it further resolved that the Board recognizes the ongoing need, in addition to the ACF Regulations, for statewide action to target incentives and infrastructure development to disadvantaged and low-income communities.

Be it further resolved that the Executive Officer shall provide an update to the Board by 2028 on the status of implementation of the ACF regulation.

Be it further resolved that, consistent with the latest Scoping Plan, the Board recognizes that the successful implementation of the food waste diversion requirements and methane emissions reductions mandated by SB 1383 are critical to the State's climate goals. The Board further recognizes that multiple reliable uses for non-fossil biomethane will be needed for successful implementation. The Board recognizes the need for coordination meetings with other state agencies such as CEC, CPUC, State Water Resources Control Board, CalRecycle, CDFA, CRNA, and other relevant stakeholders such as the California Association of Sanitation Agencies and the California Air Pollution Control Officers Association, to implement SB 1383 and SB 1440.⁵⁴ As such, the Board directs staff to prioritize policy discussions related to SB 1440 implementation and discussions on how to transition biomethane into hard to decarbonize sectors, or as a feedstock to produce hydrogen for FCEV fuel and to produce electricity to charge BEVs.

⁵⁴ (Hueso ch. 739, Stats. of 2018). Public Utilities Code Article 10, Sections 650 and 651.